



BandToken
Smart Contract
Audit Report

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AUDITED DETAILS

Audited Project

| Project name | Token ticker | Blockchain |
|--------------|--------------|---------------|
| BandToken | BAND | Polygon Matic |

Addresses

| | |
|---------------------------|--|
| Contract address | 0xa8b1e0764f85f53dfe21760e8afe5446d82606ac |
| Contract deployer address | 0x63ec5767F54F6943750A70eB6117EA2D9Ca77313 |

Project Website

<https://bandprotocol.com/>

Codebase

<https://polygonscan.com/address/0xa8b1e0764f85f53dfe21760e8afe5446d82606ac#code>

SUMMARY

Band Protocol is a cross-chain data oracle platform that can take real-world data and supply it to on-chain applications while also connecting APIs to smart contracts to facilitate the exchange of information between on-chain and off-chain data sources.

Contract Summary

Documentation Quality

BandToken provides a very poor documentation with standard of solidity base code.

- The technical description is provided unclear and disorganized.

Code Quality

The Overall quality of the basecode is poor.

- Solidity basecode and rules are unclear and disorganized by BandToken.

Test Coverage

Test coverage of the project is 100% (Through Codebase)

Audit Findings Summary

- SWC-110 SWC-123 | It is recommended to use of revert(), assert(), and require() in Solidity, and the new REVERT opcode in the EVM on lines 24.
- SWC-112 | Use delegatecall with caution and make sure to never call into untrusted contracts on lines 24.

CONCLUSION

We have audited the BandToken project released in March 2021 to find issues and identify potential security vulnerabilities in the BandToken project. This process is used to find technical issues and security loopholes that may be found in smart contracts.

The security audit report yielded unsatisfactory results, discovering high-risk and low-risk issues.

Writing a contract that does not follow the Solidity style guide can pose a significant risk. The serious and low problems we found in the smart contract are the contract delegates execution to another contract with a user-supplied address., and low-risk issue requirement violation. The smart contract delegates execution to a user-supplied address. This could allow an attacker to execute arbitrary code in the context of this contract account and manipulate the state of the contract account or execute actions on its behalf. A requirement was violated in a nested call, and the call was reverted. Ensure valid inputs are provided to the nested call (for instance, via passed arguments).

We were recommended to keep being aware of investing in this risky smart contract.

AUDIT RESULT

| Article | Category | Description | Result |
|-----------------------------------|--------------------|---|-------------|
| Default Visibility | SWC-100 SWC-108 | Functions and state variables visibility should be set explicitly. Visibility levels should be specified consciously. | PASS |
| Integer Overflow and Underflow | SWC-101 | If unchecked math is used, all math operations should be safe from overflows and underflows. | PASS |
| Outdated Compiler Version | SWC-102 | It is recommended to use a recent version of the Solidity compiler. | PASS |
| Floating Pragma | SWC-103 | Contracts should be deployed with the same compiler version and flags that they have been tested thoroughly. | PASS |
| Unchecked Call Return Value | SWC-104 | The return value of a message call should be checked. | PASS |
| Unprotected Ether Withdrawal | SWC-105 | Due to missing or insufficient access controls, malicious parties can withdraw from the contract. | PASS |
| SELFDESTRUCT Instruction | SWC-106 | The contract should not be self-destructible while it has funds belonging to users. | PASS |
| Reentrancy | SWC-107 | Check effect interaction pattern should be followed if the code performs recursive call. | PASS |
| Uninitialized Storage Pointer | SWC-109 | Uninitialized local storage variables can point to unexpected storage locations in the contract. | PASS |
| Assert Violation | SWC-110 SWC-123 | Properly functioning code should never reach a failing assert statement. | ISSUE FOUND |
| Deprecated Solidity Functions | SWC-111 | Deprecated built-in functions should never be used. | PASS |
| Delegate call to Untrusted Callee | SWC-112 | Delegatecalls should only be allowed to trusted addresses. | ISSUE FOUND |

| | | | |
|-------------------------------------|-------------------------------|---|------|
| DoS (Denial of Service) | SWC-113 SWC-128 | Execution of the code should never be blocked by a specific contract state unless required. | PASS |
| Race Conditions | SWC-114 | Race Conditions and Transactions Order Dependency should not be possible. | PASS |
| Authorization through tx.origin | SWC-115 | tx.origin should not be used for authorization. | PASS |
| Block values as a proxy for time | SWC-116 | Block numbers should not be used for time calculations. | PASS |
| Signature Unique ID | SWC-117 SWC-121 SWC-122 | Signed messages should always have a unique id. A transaction hash should not be used as a unique id. | PASS |
| Incorrect Constructor Name | SWC-118 | Constructors are special functions that are called only once during the contract creation. | PASS |
| Shadowing State Variable | SWC-119 | State variables should not be shadowed. | PASS |
| Weak Sources of Randomness | SWC-120 | Random values should never be generated from Chain Attributes or be predictable. | PASS |
| Write to Arbitrary Storage Location | SWC-124 | The contract is responsible for ensuring that only authorized user or contract accounts may write to sensitive storage locations. | PASS |
| Incorrect Inheritance Order | SWC-125 | When inheriting multiple contracts, especially if they have identical functions, a developer should carefully specify inheritance in the correct order. The rule of thumb is to inherit contracts from more /general/ to more /specific/. | PASS |
| Insufficient Gas Griefing | SWC-126 | Insufficient gas griefing attacks can be performed on contracts which accept data and use it in a sub-call on another contract. | PASS |
| Arbitrary Jump Function | SWC-127 | As Solidity doesnt support pointer arithmetics, it is impossible to change such variable to an arbitrary value. | PASS |

| | | | |
|----------------------------|--------------------|--|------|
| Typographical Error | SWC-129 | A typographical error can occur for example when the intent of a defined operation is to sum a number to a variable. | PASS |
| Override control character | SWC-130 | Malicious actors can use the Right-To-Left-Override unicode character to force RTL text rendering and confuse users as to the real intent of a contract. | PASS |
| Unused variables | SWC-131 SWC-135 | Unused variables are allowed in Solidity and they do not pose a direct security issue. | PASS |
| Unexpected Ether balance | SWC-132 | Contracts can behave erroneously when they strictly assume a specific Ether balance. | PASS |
| Hash Collisions Variable | SWC-133 | Using <code>abi.encodePacked()</code> with multiple variable length arguments can, in certain situations, lead to a hash collision. | PASS |
| Hardcoded gas amount | SWC-134 | The <code>transfer()</code> and <code>send()</code> functions forward a fixed amount of 2300 gas. | PASS |
| Unencrypted Private Data | SWC-136 | It is a common misconception that private type variables cannot be read. | PASS |

SMART CONTRACT ANALYSIS

| | |
|------------------|---|
| Started | Saturday Mar 06 2021 07:54:29 GMT+0000 (Coordinated Universal Time) |
| Finished | Sunday Mar 07 2021 11:14:26 GMT+0000 (Coordinated Universal Time) |
| Mode | Standard |
| Main Source File | UChildERC20Proxy.sol |

Detected Issues

| ID | Title | Severity | Status |
|---------|--|----------|--------------|
| SWC-112 | THE CONTRACT DELEGATES EXECUTION TO ANOTHER CONTRACT WITH A USER-SUPPLIED ADDRESS. | high | acknowledged |
| SWC-123 | REQUIREMENT VIOLATION. | low | acknowledged |

SWC-112 | THE CONTRACT DELEGATES EXECUTION TO ANOTHER CONTRACT WITH A USER-SUPPLIED ADDRESS.

LINE 24

high SEVERITY

The smart contract delegates execution to a user-supplied address. This could allow an attacker to execute arbitrary code in the context of this contract account and manipulate the state of the contract account or execute actions on its behalf.

Source File

- UChildERC20Proxy.sol

Locations

```
23 assembly {
24   let result := delegatecall(
25     sub(gas(), 10000),
26     _dst,
27     add(_calldata, 0x20),
28
```

SWC-123 | REQUIREMENT VIOLATION.

LINE 24

low SEVERITY

A requirement was violated in a nested call and the call was reverted as a result. Make sure valid inputs are provided to the nested call (for instance, via passed arguments).

Source File

- UChildERC20Proxy.sol

Locations

```
23  assembly {
24  let result := delegatecall(
25  sub(gas(), 10000),
26  _dst,
27  add(_calldata, 0x20),
28
```

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This is a limited report on our findings based on our analysis, in accordance with good industry practice as of the date of this report, in relation to cybersecurity vulnerabilities and issues in the framework and algorithms based on smart contracts, the details of which are set out in this report. In order to get a full view of our analysis, it is crucial for you to read the full report. While we have done our best in conducting our analysis and producing this report, it is important to note that you should not rely on this report and cannot claim against us on the basis of what it says or doesn’t say, or how we produced it, and it is important for you to conduct your own independent investigations before making any decisions. We go into more detail on this in the below disclaimer below – please make sure to read it in full.

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ABOUT US

Sysfixed is a blockchain security certification organization established in 2021 with the objective to provide smart contract security services and verify their correctness in blockchain-based protocols. Sysfixed automatically scans for security vulnerabilities in Ethereum and other EVM-based blockchain smart contracts. Sysfixed a comprehensive range of analysis techniques—including static analysis, dynamic analysis, and symbolic execution—can accurately detect security vulnerabilities to provide an in-depth analysis report. With a vibrant ecosystem of world-class integration partners that amplify developer productivity, Sysfixed can be utilized in all phases of your project's lifecycle. Our team of security experts is dedicated to the research and improvement of our tools and techniques used to fortify your code.